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Royal Astronomical Society, at London; from the Department of State, at Washington; from James B. Francis; from the Public Library, of Boston; from the United States Naval Observatory, at Washington; from L. Lesquereux; from the Editors of the American Journal of Science and Arts; the American Athenæum; the Galaxy; and the Medical News.

Mr. Peale laid on the table a specimen of an alga (conferva), from a warm spring in Rockbridge County, Virginia. Observations were made upon this variety of vegetable growth, by Dr. Le Conte and other members.

The Minutes of the Board of Officers and Council at their last meeting, were read.

Pending nomination No. 589 and new nomination No. 590 were read.

And the Society was adjourned.

Stated Meeting, June 19, 1868.

Present, nine members.

Dr. WOOD, President, in the Chair.

Dr. E. Rhoads, a recently elected member, was introduced and took his seat.

Letters were read: from the Hungarian Academy of Sciences, at Pesth, dated August 13th, 1865; from the Nassau Society of Natural Philosophy, at Wiesbaden, January 8th, 1868; from the Royal Prussian Academy of Science, at Berlin, December 31st, 1867; from the Royal Society of Northern Antiquaries of Copenhagen, October, 1867; from the Imperial and Royal Zoologico-Botanical Society at Vienna, February 25th, 1868; from the Royal Society of Victoria, at Melbourne; from the Royal Academy of History at Madrid, January 21st, 1868; from the Chicago Academy of Sciences, April 5th, 1868; from the Superintendent of the United States Naval Observatory, May 3d, 1868, severally

announcing donations; also, from the Prussian Natural History Society, Bonn, March 1st, 1868; from the Royal Zoologico-Botanical Society at Vienna, January, 1868; from the Nassau Society of Natural Philosophy, at Wiesbaden, January 8th, 1868; from the Batavian Academy at Rotterdam, October 23d, 1867; from the Royal Library at the Hague, October 23d, 1867; and from the Royal Academy at Madrid, January 21st, 1868, severally acknowledging the receipt of publications of this Society.

Donations for the Library were announced, viz., from Academies: the Hungarian, of Sciences, at Pesth; the Royal, of Sciences, at Berlin; the Chicago, of Sciences; and from the Natural, of Sciences, of Philadelphia. From Societies: the Imperial, of Naturalists, at Moscow; Royal Danish, of Sciences, at Copenhagen; the Royal Northern, of Antiquaries, at Copenhagen; the Royal Danish, at Havnian; the Offenbach am Main, of Physics; the Prussian Natural History, at Bonn; the Royal Zoologico-Botanical, at Vienna; the Helvetic, of Natural Sciences, at Rheinfelden; the Royal, of Victoria, at Melbourne; the Geographical, of Paris; the Royal, of London; the Meteorological, of London; the Geological, of London; the Chemical, of London; the Geological and Polytechnic, of Leeds; the Boston Natural History; and the American Pomological. From the Royal Institution of Great Britain. From Institutes: the Peabody, of Baltimore; the Essex, of Salem; the Wilmington, Delaware; and the Franklin. From Dr. Arthur Von Cettingen, of Dorpat; from M. Charles des Molines, of Bordeaux; Charles Daubeny, M.D., of Oxford; Martyn Paine, M.D., of New York; Charles H. Hart, Philadelphia. From the Freedmen's Bureau, and the publishers of Daily News.

The death of James Buchanan, a member of this Society, was announced as occurring in June, aged seventy-five years.

Mr. Peale read the following communication on the manufacture and ornamentation of the pottery of the stone age.

The manufacture and use of pottery during that portion of the stone age, which has been expressively called by A. Mor-

lot "the first great stage of civilization,"* is one of those curious facts that elicits surprise, and rivets the attention of all who are engaged in archæological researches.

I take occasion here, most emphatically to disclaim any adhesion to, or countenance of what I must designate as the absurd theory, of the original growth of our race from a state of barbarism to one of civilization and refinement. This notion has its basis in the theory of development, which is as illogical as it is impious.

The primeval state of man was glorious and beautiful, created in the image of his Maker; his decadence has dated from the time that the race was scattered over all the earth; and the further it departed from its original purity, the lower it descended in the scale, until some portions of it were little above the beasts that perish, lower it is evident, than that condition characterized as the stone age. The spark of man's divine origin has never been entirely extinguished, and wherever, or whenever that spark has kindled into flame, the condition has been one of progress. May we not hope that it is now an upward one, in purity and truth, as it certainly is in knowledge and skill.

Whether the practice of the art under consideration, existed during that period, when the rudest works of man found in the drift of Europe were made, is yet to be demonstrated, certain it is, however, that it accompanies the stone age throughout nearly all time and in all places. It is characterized by forms, marks, and other peculiarities, which, although they differ in some respects, yet, through the whole, there run veins of similarity that are unmistakable and truly wonderful, when we reflect that continents are embraced in the geographical limits, and not only centuries, but decades of centuries in the measure of time, over which these facts are spread.

It is not my purpose to attempt a full illustration of the subject, that has been so well done by zealous observers,† and all the circumstances have been so fully selected and enumerated, that there is little left for those who follow, but I desire to confirm the facts as far as the specimens in my cabinet are in evi-

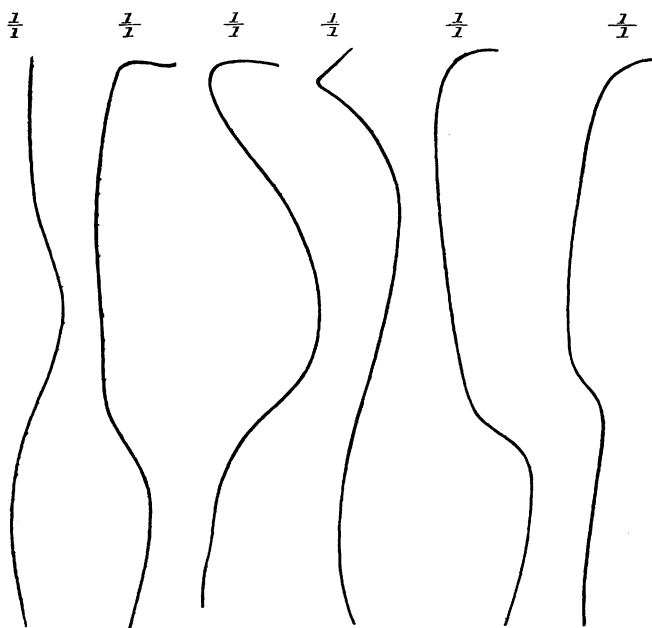
* Professor A. Morlot, of Berne, Switzerland.

† Messrs. Squier & Davis, Charles Rau, Catlin, and others.

dence, and to add my mite of novelty and interest, as it appears to me, to the subject.

And, first of the forms, which the plainest of these ceramic efforts assume, whether derived from the contemplation of the natural objects around, such as gourds, &c., which are always pleasing to the eye (and which were possibly used as moulds), or suggested by the forms of flowers, we find them nearly always graceful, and, in many cases, those lines and curves, which we call classic, exist in some of the parts, and not unfrequently in the whole structure.

The simple forms alluded to above, have been figured by Mr. Charles Rau; they abound in the places examined and so carefully described by him. The specimens from the banks of the Delaware are very similar, but they are also varied to a considerable extent, and if the expression can be allowed, are



more pretentious, being frequently curved gracefully near the brim or moulded into a band, sometimes also scolloped in a manner somewhat difficult to describe, and in the absence of perfect or whole examples, impossible to figure.

The above outlines are fac-similes of some of these forms.

The style of ornament is shown in Figures No. 1, in Plate IX, all of which are drawn full size or $\frac{1}{4}$.

From the variety in the ornamentation and contour indicated by the fragments so numerous dispersed in the vicinity of the Delaware, from its mouth to the sources of that river, there is abundant evidence of an advanced state of the art; and that it was not confined to the production of vessels for the cooking of food, or preservation of stores, &c., is proved by the existence of pipes of burnt clay, and the imitation of natural objects in the same material. The wolf's head, in my collection, the emblem of the Minsi Tribe, the dwellers on these shores, and the undoubted makers of these relics, is full of character, and, it is not too much to say, artistic merit.

We cannot, however, claim for this tribe any exclusive peculiarity of form. The vase, Fig. 1, Plate X, was made by the Mandans; the original was brought from high up the Missouri by General Sully, to whom it was presented by an old chief of that tribe, the few remaining members of which are fast decreasing in numbers, and will soon have passed away: the hard but inevitable destiny of the Indian, in contact with the white race. The old chief told the General "that it was the last article of the ancient pattern in their nation, now nearly extinct; how old it was, he could not tell."

This tribe, once celebrated for their skill in the ceramic art, do not now practise it, and Mr. Catlin's interesting remarks* are of things and customs that no longer exist.

The form, it will be observed, is good, but the ornamentation is not profuse, and it has the advantage of loops for suspension, which construction has not occurred in any of the specimens from the Delaware.

The formation of the ware within basket-work, has been repeatedly noticed,† and the number of fragments of vessels of large size, found in the vicinity of salt springs, are facts well established, proving the manufacture of salt by people of whom, in some instances, all record is lost. Fig. 2, Plate X, is a drawing of a specimen of this kind from Gallatin Co., Illinois, found in such a locality, accompanied by large quanti-

* "Catlin's North American Indians," vol. 1, p. 116.

† Charles Rau, on "Indian Pottery."

ties of broken fresh-water shells, evidently intended for use in the composition of the ware.

From the same place, other specimens have been taken, which are ornamented with lines and curves cut roughly into the clay whilst in a plastic state, possibly in imitation of the more perfect and regular basket-work impressions, but very inferior in symmetry and appearance.

In the ornamentation of the pottery of the Delaware, a very general preponderance of diagonal lines is observed, of which Fig. 1, Plate IX, is an illustration.

There is reason to believe that this style was prevalent in the stone age throughout the world, and that it was employed in man's first attempts at adornment; it is much to be regretted, that the examples within our reach are too few to authorize the positive assertion, but the probabilities are in favor of the supposition. It appears in many other specimens in my collection, in the rude pottery of the ancient Irish, and in the figures of vases or pots from the lacustrine dwellings of the ancient Swiss.

It has been demonstrated that the manufacture of pottery accompanies the stone age, but it must also be admitted that it was always in an imperfect state or rude condition, made without the use of the wheel, more or less imperfectly burned, and never glazed. Notwithstanding these imperfections, it was often well, if not beautifully formed.

The art also characterizes most perfectly the highest condition of civilization and refinement in all ages; it was, and is in its elaborate and costly results, the most familiar illustration of taste in form, and perfection of art in material, decoration, and execution. It is scarcely necessary to refer to the porcelain of Sevres, in proof of these assertions for our day, and generation, and for the classic days of antiquity, to the Etruscan vases and pattella of the tombs of Etruria,* and the buried dwellings of Pompeii.

I have now to solicit attention to the principal object of this communication, and approach it with ideas to which it is difficult to give suitable expression.

* A fine specimen found on the estate of Lucien Bonaparte, at Vitassonia, and presented to the Society by Count Survilliers. It is ornamented with the "Meandre."

It must be begun far back in antiquity, for it has its beginning at a date which approaches to primeval times.

In the Imperial Museum in Peking, China, there is deposited a large number of bronze vases,* some of which, after critical examination, date in origin as early as the Second Dynasty ("des Chang"), which terminated 1766 years before our era. These vases have been carefully figured; they exhibit peculiar and fine forms, and are most elaborately ornamented.† Fig. 1, Plate XI. An examination of these vases shows there was, at that early date, an ornamental device much used for works of art, which is now well known, and in high estimation. It is called in French "Meandre," Fig. 2, Plate XI, in the language of architecture the Greek-fret, in consequence of its employment, by that tasteful people, upon their most perfect specimens of the ceramic art, and in personal and all other decoration.

We call it Greek and classic, and doubtless have derived it from that refined nation, but, as shown, it was used by the Chinese before the Greeks were a nation, and I have now to show, that it has its origin in man's organization and endowment, whatever its antiquity may be. Fig. 1, Plate XII, is drawn from a specimen of ancient Mexican manufacture, in the Cabinet of the American Philosophical Society, being a fragment of pottery in the collection presented by the late J. R. Poinsett.

In this specimen the convolutions are complex, and remind one of the elaborate examples seen in the embellishments and decorations of our books and dwellings. And finally, and most unexpectedly, we find an attempt or effort (or by whatever term it may be expressed), to delineate the same ornamental device indicated in the pottery of the aborigines of this country, of which Fig. 2, Plates XII and IX, are drawings, from specimens in my collection found in the vicinity of Lambertsville, New Jersey, which were made, there is no doubt, by the practised hands of the Minsi Tribe heretofore noticed.

These examples tell their own story so plainly, that comment upon them is unnecessary, but, it may be added, that many of what we call novelties in modern affairs, are only the forgotten facts of previous ages.

* "Historical Description of China." M. G. Pauthier, Paris, 1839.

† "Generic name Ting Tripod, principally used for sacrifices," Pauthier.

Mr. P. E. Chase made some remarks on the fall of rain, as affected by the moon.

The discussion of the moon's influence on the weather has been recently revived by European meteorologists, and an article by George Dines, Esq., in the Proceedings of the Meteorological Society, No. 36, contains some valuable tables, which seem to me worthy of special attention. Mr. Dines was intrusted with the journal of Miss Caroline Molesworth, of Cobham Lodge, Surrey, from which he was "enabled to extract the rain which fell during each day of the moon's age, for a period extending (with few interruptions) over forty years." From these extracts he has condensed synopses for five years, ten years, twenty years, and forty years, arranged according to the several days of the moon's age, with two subordinate tables, one of which contains "groups of three or four days preceding and following each change of the moon," the other gives the proportionate amounts of rain in the successive quarters of the lunar month. There are also statements of the number of days on which .01 inches or more of rain fell, and of the number of days on which .25 inches or more fell, during the entire period. These summaries, as well as the data on which they are based, lead the author to the "decided opinion that the fall of rain *is in no way influenced by the changes of the moon, or by the moon's age.*"

The influence of the moon on the ocean tides, on the fluctuations of the barometer and magnetic needle, and on the winds (see Glaisher's Tables, Proc. Met. Soc., No. 30), is so well known that the inference of a similar influence on the rainfall seems almost irresistible. I was therefore naturally startled at Mr. Dines's conclusion, and as his evident impartiality forbade any doubts of the accuracy of his results, I was led to examine into the correctness of his method. The observations cover a period of a little more than two Metonic cycles, and by the tabular arrangement the effects of the revolution of the moon's nodes, as well as those of varying latitude and declination, are almost entirely eliminated.* The station is in a high northern

* Lubbock found a barometric elevation of nearly .1 inch for 17° increase of declination. *Phil. Trans.*, 1841, p. 73. He appears to have

latitude, and within the influence of the Gulf Stream, therefore the lunar modifications of the climate, especially when those modifications are estimated merely from their equatorial means, are comparatively unimportant; the four lunar quarters, each embracing an entire interval between a spring and a neap tide, are precisely the divisions which, when the periods are sufficiently extended, would eliminate most of the remaining evidences of lunar disturbance. Still, if we examine the half-cycles, or ten-year periods, we may observe that the half-months of lunar conjunction present a rainfall alternately greater and less than the half-months of opposition, a fact which suggests a possible dependence on the alternately predominating north and south latitude.

It is impossible, from the tables, to determine the extent of such a dependence. Mr. Dines, who has the necessary materials at his command, may perhaps deem the subject worthy of further investigation. The division of the month may be easily altered so as to correspond more nearly with the times of presumable maximum and minimum disturbance. If we regard the day of each change of phase as the middle day of a week, (counting the half-sum of the 5th and 12th days in the first quarter, and the half-sum of the 20th and 27th days in the third quarter), the seven-days' aggregates in Table I, and in the two summaries on pp. 136-7 (*loc. cit.*), will furnish the following results:

been led to the investigation by Howard's remarks "on a cycle of eighteen years in the mean annual height of the barometer in the climate of London." *Clim. of London*, 2d ed., v. 1, p. 172; *Phil. Trans.*, 1841, p. 277, *seq.* See also Zenger's discussion of the mean annual temperature, as affected by the revolution of the moon's nodes and apsides. *Phil. Mag.*, v. 35, June, 1868.

Aggregates of Tabular Ratios and Number of Rainy Days.	Week of New Moon.	Week of First Quarter.	Week of Full Moon.	Week of Last Quarter.	Two Weeks of Syzygy.	Two Weeks of Quadrature.
1825 to 1829,	770	606	679	766	1449	1372
1830 to 1834,	657	797	599	731	1256	1528
1835 to 1839,	598	800	668	617	1266	1417
1840 to 1844,	643	708	760	662	1403	1370
1845 to 1849,	830	726	602	627	1432	1353
1850 to 1854,	687	726	614	810	1301	1536
1855 to 1859,	507	722	728	735	1235	1457
1860 to 1864,	706	680	679	754	1385	1434
1825 to 1834,	716	698	638	750	1354	1448
1835 to 1844,	618	753	771	639	1389	1392
1845 to 1854,	765	724	608	711	1373	1435
1855 to 1864,	651	701	702	744	1353	1445
1825 to 1844,	667	726	704	693	1371	1419
1845 to 1864,	708	714	656	729	1364	1443
1825 to 1864,	687	721	681	709	1368	1430
.01 inch or more,	1490	1484	1446	1511	2936	2995
.25 inches or more, . . .	260	268	250	272	510	540

It may thus be seen that, *notwithstanding the complete veiling of all the disturbances which may be due to the moon's variable distance and declination, there was a marked tendency to increase at quadrature and to decrease at syzygy, both in the amount of rain and in the number of rainy days.* This tendency, which becomes evident even in the majority of the five-years' groupings, is uniformly shown in all the groups of ten years, twenty years, and forty years, as well as in the number of rainy days and in the number of heavy rains during the entire period.

In a future communication I propose to discuss the observations at the Pennsylvania Hospital, which demonstrate the existence of similar tides at Philadelphia. The forty years' aggregates (1825 to 1864, inclusive, at each station) exhibit the following ratios of weekly rainfall:

	Surrey.	Philadelphia.
Week of new moon,	98.2	97.6
“ first quarter,	103.1	100.3
“ full moon,	97.4	95.8
“ last quarter,	101.4	106.3

The tide is so strongly marked at Mussoorie, on the southern range of the Himalaya Mountains, as to be strikingly shown

by 13 years' observations (1854–1866) on the days of change. (See Mr. Hennessey's communication, Proc. Roy. Soc., v. 16, December 12, 1867.) The mean results are,—

	Average daily fall.	Ratios.
Day of new moon,402	86.2
“ first quarter,535	114.7
“ full moon,399	85.6
“ last quarter.529	113.5

On motion, ordered that the Society of Natural Sciences at Bremen be added to the list of associations to receive the publications of this Society.

On motion of Mr. Peale,

Resolved, That a committee be appointed to procure a portrait of the late President, Dr. Franklin Bache.

And the President appointed Mr. Peale that committee.

And the Society was adjourned.